

ABSTRACT OF THE DISCLOSURE

[00126] Spectroscopic analysis systems and methods for analyzing samples are disclosed. An analysis system may contain an electromagnetic radiation source to provide radiation, a spectroscopic analysis chamber to perform a coherent Raman spectroscopy (e.g., stimulated Raman or coherent anti-Stokes Raman spectroscopy), and a radiation detector to detect radiation based on the spectroscopy. The chamber may have a resonant cavity to contain a sample for analysis, at least one window to the cavity to transmit the first radiation into the cavity and to transmit a second radiation out, a plurality of reflectors affixed to a housing of the cavity to reflect radiation of a predetermined frequency, the plurality of reflectors separated by a distance that is sufficient to resonate the radiation. The spectroscopic analysis system may be coupled with a nucleic acid sequencing system to receive a single nucleic acid derivative in solution and identify the derivative to sequence the nucleic acid.